Oct. 15, 1929. P. A. HAUENSTEIN 1,731,661

ELECTRICAL CURRENT TAP PLUG OR CONNECTER

Filed May 14, 1926

Fig. 1.

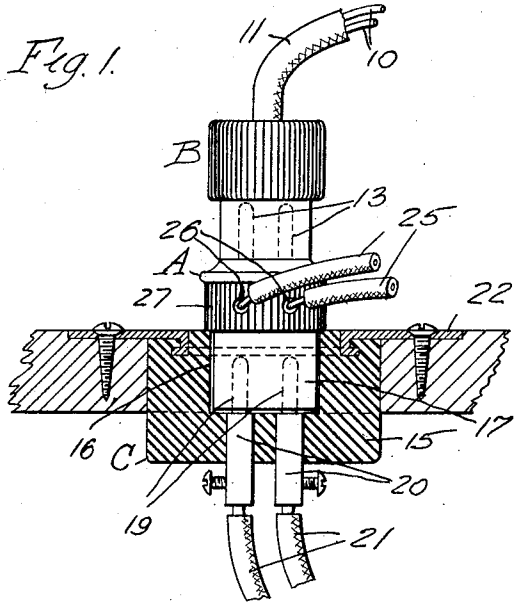


Fig. 2.

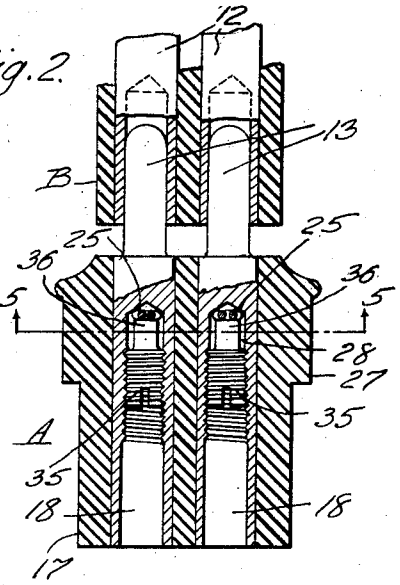


Fig. 3.

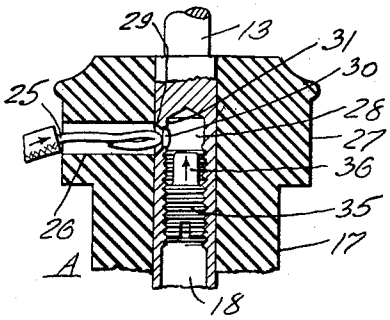
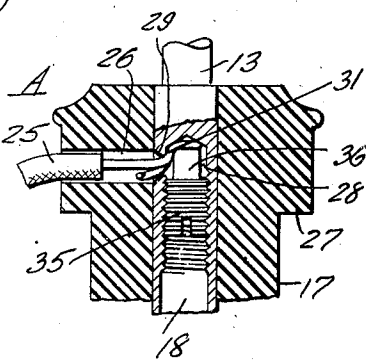


Fig. 4.



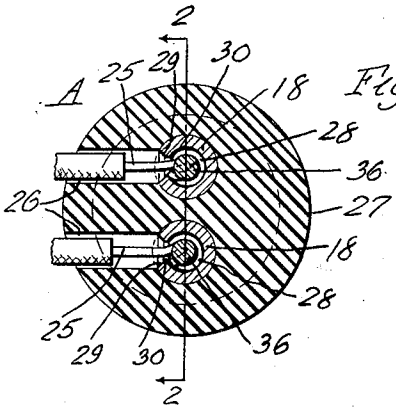


Fig. 5.

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UNITED STATES PATENT OFFICE

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ELECTRICAL CURRENT TAP PLUG OR CONNECTER

Application filed May 14, 1926. Serial No. 109,129.

This invention relates to improvements in detachable, electrical current tap plugs or connecters. These devices are adapted for use on a machine, for example, a sewing machine, and are placed in an electric circuit leading from an electric socket or other connection to a motor of the machine, for the purpose of providing a quick detachable connection between the terminals of the conductors from said source of supply, and the terminals of the conductors of said motor. Connecters of this sort have been provided having means whereby the terminals of a branch circuit may be tapped into the line, for supplying current to any desired electrical device, such, for example, as an electric lamp.

The objects of the invention are to provide an electrical current tap plug or connecter of improved, simplified and inexpensive construction, which is small and compact and comprises few parts and which will not readily get out of order; also to construct the connecter so that good electrical and mechanical connections are provided between the conductors of the main circuit and branch circuit; also to construct the contact members of the plug or connecter so that while the aforementioned connections are made possible, the branch circuit can be quickly and easily connected or disconnected at will, and in which the construction is such that the ends of the branch circuit will not be sheared off or injured when the connection is made.

Other objects are to improve electrical plugs or connecters of the sort mentioned in the other respects hereinafter set forth.

In the drawings:—

Fig. 1 is a side elevation of the improved electrical current tap plug or connecter showing the same in operative relation to the conductors of a main and a branch circuit.

Fig. 2 is a longitudinal section, on an enlarged scale, of the connecter, in line 2—2, Fig. 5.

Fig. 3 is a fragmentary, similar view thereof at right angles to Fig. 2, showing an end of one of the conductors of the branch circuit about to be secured to the connecter.

Fig. 4 is a similar view thereof showing the conductor in its secured position.

Fig. 5 is a transverse section of the connecter on line 5—5, Fig. 2.

As shown in Figs. 1 and 2, the connecter, designated generally by A, is detachably secured in the main circuit by means of interfitting connections between said conecter and plugs or attaching members B and C. These members B and C are of well known form, the member B, for example, being attached to the terminals of a pair of conductors 10 leading from the source of power, and which, as usual, are in the form of a flexible cord 11. The plug B is provided with fixed metallic contact members 12, to one end of each of which one of the conductors 10 is secured, the other end of each contact member 12 being hollow and adapted to receive a contact pin 13 projecting from the connecter A. The other plug C is usually stationarily secured to a part of the machine to be operated from the source of power, and comprises an insulated body 15 recessed at 16 for the reception of the reduced portion 17 of the cylindrical body of the connecter A. The connecter is provided with a pair of hollow, metallic contact sleeves 18 preferably formed integral with the pins 13 and adapted to receive contact pins 19, see Fig. 1, projecting into the recess 16 and which are formed on, or secured to, fixed contact members 20 imbedded in the body 15, and which are adapted to receive the terminals of another pair of conductors 21 and which lead to the motor of the machine to complete the main circuit. The body 15 of the plug C is rigidly secured to a securing plate 22 attached to any suitable part of the machine. Plugs B and C of other form may be used if desired, as they of themselves form no part of the invention.

In accordance with the invention, the terminals of a branch circuit are adapted to be connected to the contact sleeves 18 of the connecter A. In the embodiment shown, the terminals of a pair of conductors 25 of the branch circuit are shown as extending into transverse apertures 26 in the enlarged outer portion 27 of the connecter body, being securely but releasably attached to the contact

sleeves of the connecter A, so as to form a good mechanical and electrical connection therewith, in the following manner:

Each of the contact sleeves 18, before mentioned, at a point inwardly beyond the inner ends of the pins 19, is formed with a reduced bore 28 into which one of the transverse apertures 26 extends, see Figs. 3–5. Each of said apertures 26 is preferably formed with a drill, the tip of which is adapted to cut into the metallic wall of the bore 28 in such a way as to provide a conical seat 29, and a reduced opening 30 positioned so as to leave, between the end of the bore 28 and said opening 30, a shoulder 31. Outwardly beyond its bore 28 each tubular contact sleeve 18 is tapped or threaded for the reception of a screw 35 preferably having a reduced, substantially cylindrical inner part 36 formed with a flat end. The threaded portion of the sleeve 18 is of such length that the screw 35 may be retracted, as shown in Fig. 3, a distance sufficient to permit the insertion of the end or terminal of the conductor 25 through the opening 30 into the bore 28. The conical seat 29 is adapted to guide the end of the conductor, which may, if desired, be looped, into and through the hole 30. If a screw driver is inserted into the sleeve 18, the screw 35 may be advanced so as to engage the flat end of the part 36 of the screw with the looped end of the conductor 25 and press the same tightly against the bottom of the bore 28. In doing this, the looped end of the conductor is bent or snubbed over the shoulder 31, so that the extreme end of the loop is offset with regard to the portion of the conductor remaining in the aperture 26. In this manner, considerable resistance is afforded to outward pulls or strains on the conductor 25, such as to prevent, under all ordinary conditions, the accidental disconnection of the conductor with the connecter A.

The diameter of the end 36 of the screw 35 is considerably smaller than the diameter of the bore 28, and is so proportioned that the looped end of the conductor 25 is bent over the shoulder 31 without shearing the soft metal of the conductor, and by forming the end portion 36 of the screw with a flat face, the screw engages a considerable area of the looped end of the conductor and presses the same firmly against the bottom of the bore 28, thereby making a firm mechanical and electrical connection. Nevertheless, the branch conductors 25 can be readily disconnected and reattached to the main circuit, at will, when desired without injuring the conductors or the parts of the connecter.

The connecter described is simple, comprising few parts, which can be inexpensively and expeditiously manufactured and provides, in use, a thoroughly practical, strong and desirable mechanical and electrical connection between the main and branch circuits. When it is desired to take current from the main circuit, the connecter A is inserted into the attaching member C and the connecter B is then placed into operative relation to the connecter A so that the contact pins or terminals 13 enter the sockets in the contact members 12. When no branch circuit is required, the connecter B is placed directly into engagement with the connecter C, the branch connecter A being omitted.

I claim as my invention:—

1. An electrical current tap plug comprising an insulating body and a pair of contact elements embedded therein and extending therethrough, each having one end recessed for the reception of one terminal of a main circuit, and having its opposite end formed for connection with another terminal of said main circuit, a pair of branch circuit conductors, said body having a pair of lateral apertures extending inwardly from the periphery thereof and communicating with said recesses in said contact elements and through which the terminals of said branch conductors may be passed into said recesses, a shoulder between the inner end of each of said apertures and the bottom of the recess with which it communicates, said recess being threaded adjacent said shoulder, and a screw engaging in said threads and having an end of reduced diameter adapted to abut against the terminal of said branch conductor therein, bend it over said shoulder, and clamp the same firmly in said recess.

2. An electrical current tap plug comprising an insulating body and a pair of contact elements embedded therein and extending therethrough, each having one end recessed for the reception of one terminal of a main circuit, and having its opposite end formed for connection with another terminal of said main circuit, a pair of branch circuit conductors, said body having a pair of lateral apertures extending inwardly from the periphery thereof and communicating with said recesses in said contact elements and through which the terminals of said branch conductors may be passed into said recesses, the open inner end of each of said lateral apertures being reduced and having a conical seat outwardly beyond said reduced portion and connecting therewith to form guide means for directing a branch terminal into said recess, each of said recesses being threaded adjacent its inner end, and a screw engaging in said threads and having an end of reduced diameter adapted to be engaged with said branch terminal to clamp its firmly in said recess.

3. An electrical current tap plug comprising an insulating body and a pair of contact elements embedded therein and extending therethrough, each having one end recessed for the reception of one terminal of a main circuit, and having its opposite end formed

for connection with another terminal of said main circuit, a pair of branch circuit conductors, said body having a pair of lateral apertures extending inwardly from the periphery thereof and communicating with said recesses in said contact elements and through which the terminals of said branch conductors may be passed into said recesses, the open inner end of each of said lateral apertures being reduced and having a conical seat outwardly beyond said reduced portion and connecting therewith to form guide means for directing a branch terminal into said recess, a shoulder between said reduced open end of said aperture and the bottom of said recess, and a screw engaging in threads in said recess and having a part of smaller cross sectional area than said inner end of said recess, and which is adapted to be engaged with said branch terminal to bend it over said shoulder and clamp the same firmly in said recess, said bent portion of said terminal being adapted to extend into the clearance space between said reduced screw part and the walls of said recess.

4. An electrical current tap plug comprising an insulating body and a pair of contact elements embedded therein and extending therethrough, each having one end recessed for the reception of one terminal of a main circuit, and having its opposite end formed for connection with another terminal of said main circuit, a pair of branch circuit conductors, said body having a pair of lateral apertures extending inwardly from the periphery thereof and communicating with said recesses in said contact elements and through which the terminals of said branch circuit conductors may be passed into said recesses, and means arranged within the recessed ends of said contact elements for securing said terminals of said branch circuit conductors to said contact elements.

5. An electrical current tap plug comprising an insulating body and a pair of current conducting contact elements spaced apart and embedded in said insulating body and extending lengthwise therethrough, each having one end recessed for the reception of one terminal of a main circuit and having its opposite end formed for connection with another terminal of said main circuit, said body having a pair of lateral apertures extending therethrough and spaced apart, each lateral aperture of said body terminating in an aperture in one of said contact elements arranged near the bottom of the recess therein and forming a shoulder between the inner end of the aperture and said bottom of said recess, a pair of branch circuit conductors adapted to enter said apertures, and securing means in each recess for bending the end of a branch conductor over said shoulder and clamping the same in said recess.

6. An electrical current tap plug comprising an insulating body and a pair of current conducting contact elements spaced apart and embedded in said insulating body and extending lengthwise therethrough, each having one end recessed for the reception of one terminal of a main circuit and having its opposite end formed for connection with another terminal of said main circuit, said body having a pair of lateral apertures extending therethrough and spaced apart, each lateral aperture of said body terminating in an aperture in one of said contact elements arranged near the bottom of the recess therein and forming a shoulder between the inner end of the aperture and said bottom of said recess, a pair of branch circuit conductors adapted to enter said apertures, each of said recesses being threaded adjacent its inner end, and a screw arranged in the recess and engaging in said threads and having an end of reduced diameter adapted to be engaged with the terminal of said branch conductor to clamp it in said recess.

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